

### Contents:

Soils - The Chemical Factors .....	1
Welcome to Dr. Anson Elliott.....	2
Monitoring San José Scale.....	3
Ripe for Wine? .....	6
Powdery Mildew Can Zap the Life	
Out of Pumpkins .....	8
Power Foods .....	9
Shade Tree Decline .....	10
Coming Events .....	11

### From the Editors

by Marilyn Odneal

Hope your summer season is going well and your crops are avoiding pathogens and predators - speaking of which - Patrick Byers and Gaylord Moore have some interesting articles in this issue to help deal with pests. Remember that all past newsletters are available online at <http://mtngrv.missouristate.edu/newlet.htm> where you can also subscribe or unsubscribe to the online version of the Berry Basket. If you are interested in obtaining a print copy, please contact Pamela Mayer at the address below.

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## Soils – The Chemical Factors

By Ben Fuqua

Professor, Soil Science

Missouri State University

Both plant and animal life depends on the physical and chemical properties of soils. Physical characteristics, such as soil texture, soil structure, color, and bulk density primarily determine the % pore space, available water capacity, and rooting depth while the chemical factors control the availability of plant nutrients. Understanding the basic relationships between cation exchange capacity, base saturation, and soil pH can be helpful in developing good, sound nutrient management practices.

### Cation Exchange Capacity (CEC)

Although the CEC of a soil cannot be seen, it is one of the more important components of soils. The CEC is the reservoir or storage area for calcium, magnesium, potassium and other positively-charged nutrients (cations). Thus, the CEC is a measure of the quantity of cations adsorbed by clays and humus in soils. The units for expressing CEC are centimoles of adsorbed cations per kilogram of soil (cmol/kg) or milliequivalents of adsorbed cations per 100g of soil (meq/100g). (Although meq/100g is used on Missouri soil test reports to express CEC, the units are interchangeable; i.e. 11.5 meq/100g = 11.5 cmol/kg). The greater the soil CEC, the more storage capacity for plant nutrients in the soil.

The CEC's of Missouri soils vary greatly from one geographical region of the state to another. Soils located in northern and southeastern sections generally have higher

CEC's than those in southwest Missouri due to differences in % humus (organic matter), % clay, and the kind of clays present. Sandy and/or low organic matter content soils commonly have CEC's less than 5 cmol/kg, while soils with high clay and/or high organic matter contents can have CEC's of over 25 cmol/kg.

From the practical standpoint, the CEC primarily affects the amount and frequency of fertilizer/lime/sulfur applications required to provide the proper amount and balance of nutrients to plants. Soils with a low CEC require frequent applications of small amounts of these compounds while high CEC soils need to be amended less often but at higher rates due to the greater capacity for storing nutrients. Heavy applications of fertilizers or lime that exceed the soil's CEC result in leaching of valuable nutrients and possible pollution of water sources. Obviously, over-fertilization or over-liming a soil should be avoided.

**Soil pH** – In my opinion, soil pH is one of the most important factors in determining the success or failure of a blueberry planting. Although pH only measures the amount of hydrogen (H) ions in the soil solution, it plays a major role in the availability or unavailability of most other plant nutrients. For example, blueberries need a relatively high level of iron; a micronutrient that is abundant in most Missouri soils, but not available to plants at soil pH's higher than 6.0. Reducing the pH to 5.5 or less will increase the amount of iron available for uptake by the plant root. While excellent blueberry growth and production has been observed in soils with pH's ranging from 4.0 to 6.0, the current pH recommended for growing blueberries in Missouri (4.8 –5.2; pHs 4.5-5.0) appears to be a good "target" pH for healthy, high producing plants. (Remember that pHs (salt pH) used on Missouri soil test reports will be slightly lower than pH values that were measured using distilled water).

pHs and neutralizable acidity (NA on Missouri soil test reports) are not the same measurements, but are definitely related. pH (pHs) measures the amount of hydrogen-ions in

the soil solution while NA measures the amount of hydrogen (and other acid-forming cations) adsorbed to the soil colloids (clay and humus). High amounts of NA cause low soil pH's, while low amounts of NA result in a higher soil pH.

**Base Saturation** – The % base saturation represents the proportion of a soil's CEC that is occupied by base-forming cations, i.e. calcium, magnesium, potassium. As the % base saturation increases, the soil pH will also increase and vice versa, i.e. reducing % base saturation lowers soil pH. Thus, if an increase in pH is needed for growing tomatoes, alfalfa, or similar crops, limestone or other base-forming fertilizers should be applied. On the other hand, for production of highbush blueberries and other "acid-loving" crops, soils in Missouri usually need to be acidified (lowering the soil pH and % base saturation). This can be accomplished by incorporating compounds such as sulfur, iron sulfate, or sulfuric acid into the soil. The soil CEC, the current soil pH, and current % base saturation will determine how many pounds of limestone, sulfur, etc. will be required to give the desired pH and base saturation changes.

**Summary:** There are many ways to view the relationships between CEC, % base saturation, available nutrients, and soil pH for highbush blueberry production in Missouri. Research conducted by Benham at UMC showed that soils with a pH of 4.8-5.2 (pHs 4.5-5.0) would have a % base saturation of 50 – 63%. Since blueberry plants can be grown in Missouri soils with either a high and low CEC, the soil pH and % base saturation become the more critical factors to control. While both pH and % base saturation are easily changed, the difficult part comes in trying to keep them at the optimum level for the blueberry plants. Therefore, regular (every 1 or 2 years) testing to monitor the nutrient content in the soil and in the plant leaves is highly recommended for all blueberry grower. Utilizing the soil and plant test results, in conjunction with the "targeted" pH and % base saturation values (in relation to the soil CEC) should result in an "ideal" soil environment for blueberries.

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## Welcome to Dr. Anson Elliott

*By Patrick Byers  
Fruit Grower Advisor  
Missouri State University*

The faculty and staff of the State Fruit Experiment Station of Missouri State University are pleased to introduce Dr. Anson Elliott, who on April 1 was named the 8<sup>th</sup> director of the State Fruit Experiment Station. Dr. Elliott has deep ties to the Ozarks, having grown up on a farm in Texas County. He graduated as valedictorian from Houston High School, and continued his education at the University of Missouri, receiving his BS in agricultural education in 1965, his MS in agronomy in 1968, and his PhD, also in agronomy, in 1972. His career includes a position as vocational agriculture teacher at Clever, several years as a research plant breeder at the University of Minnesota, and since 1978 a productive association with Missouri State University. He has served as the head of the MSU Department of Agriculture since 1980.

Dr. Elliott is a recognized voice for agriculture on a regional, state, and national level. His interest in the training of future agricultural leaders is clearly evident during the several annual FFA events that bring thousands of high school students to MSU. His interest in the local agricultural economy is demonstrated by his membership on the Springfield, Mo. Area Chamber of Commerce Roundtable and his service as chairperson of the COC Agricultural Business Committee. Dr. Elliott serves on a number of advisory boards, such the Missouri Governor's Advisory Committee on Agriculture, Congressman Roy Blunt's Agriculture Advisory Committee, and Senator Kit Bond's Agriculture Advisory Committee. His leadership is recognized on a national level, as he serves on the Budget and Advocacy Committee of the National Association of State Universities and Land-Grant Colleges, the USDA - Joint Council on Food and Agricultural Science, and he was



twice president of the American Association of State Colleges of Agriculture and Renewal Resources. He has traveled internationally on behalf of agricultural issues.

Dr. Elliott has a passion for teaching, which he practiced early in his career as a vocational agriculture teacher and which he continued through his university tenure. Even today, with his many administrative responsibilities, he continues to teach several courses. He values the connection that his teaching provides with students, particularly in courses such as **Leadership**, a course for entering freshman that encourages an examination of the components of leadership, and **Technology's Impact on Society**, a general education course that explores the impact of agriculture in a global environment.

The MSU Department of Agriculture, of which the faculty and staff of the State Fruit Experiment Station are now members, has thrived under Dr. Elliott's guidance and now includes over 400 students and over 30 faculty and staff. He has encouraged the development of agricultural research programs, and successfully sought funding for projects such as the Darr Agricultural Learning Center in Springfield.

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## Monitoring San José Scale

*By Patrick Byers*

*Fruit Grower Advisor*

*Missouri State University*

San Jose Scale (SJS) is a potentially devastating insect pest of a wide range of fruit plants, including apple, pear, peach, cherry, plum, apricot, gooseberry, quince, and currant. This non-native insect was introduced into North America in 1870, and destroyed thousands of acres of orchards. With the advent of modern pesticides SJS disappeared as a major pest in managed orchards. In recent years, however, this pest is reappearing in orchards in Missouri. In some cases these are low or no spray orchards under less than adequate management; however, even well managed orchards are reporting SJS as an increasing problem.

A thorough discussion of the SJS appearance and life cycle, history, and natural enemies is found at the following websites: <http://ohioline.osu.edu/hyg-fact/2000/2039.html> /<http://www.uky.edu/Ag/Entomology/entfacts/fruit/ef204.htm> /<http://www.ipm.ucdavis.edu/PMG/r602300711.html> This article will discuss identifying scale damage, monitoring the presence and severity of scale infestation, and control measures.

### Identifying SJS damage

Often the first indication of SJS in an orchard is noted on the fruit. Feeding sites on fruit, particularly apples, are marked with a reddish spot or halo (Figure 1). Heavy infestations can lead to a large number of feeding sites, often concentrated around the stem or calyx ends of the fruit (Figure 2). These heavy infestations can result in grayish patches on the fruit. Heavy infestations lead to high fruit cull rates.

Light infestations of SJS are often initially overlooked on the twigs and branches. Watch for reddish markings, particularly on young

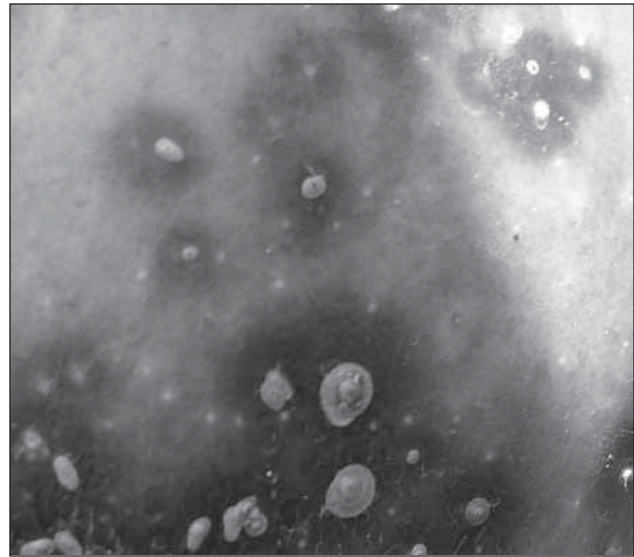


Figure 1. SJS feeding site on apple



Figure 2. Heavy infestation of SJS on apple



Figure 3. SJS feeding sites on young twig

twigs, that result from feeding (Figure 3). In heavy infestations the twigs, branches, and even the trunk are covered with a crusty, grayish mass of scale that can be scraped off with a fingernail (Figure 4). In heavy infestations scale will also feed on foliage, resulting in reddish spots on leaves (Figure 5). Heavy infestations can lead to twig and branch death, and eventual death of the tree.

### Monitoring SJS

**During harvest** – Monitor fruit for signs of SJS feeding sites. If marked fruit are noted, prepare to control the scale the next season.

**During dormant season pruning** – Monitor the tree for signs of unhealthy or dead twigs. Watch for crusty scale on twigs and branches. If signs of scale are noted, prepare a control strategy for the coming season.

**Pheromone traps** – A sticky tent trap, baited with the appropriate pheromone lure, is used to monitor the populations of male SJS. Pheromone traps are placed in infested trees prior to or during bloom. Male SJS are extremely small gnat like insects, so be sure to examine traps closely at frequent intervals (daily until the first trap catch, called the biofix). Trap catches often appear as a fine dust concentrated in the sticky trap surface near the lure. First generation male flight usually occurs after apple petal fall. Once biofix is noted, degree days are calculated on a daily basis and a running total kept. San Jose scale has a 51°F threshold temperature. Compare degree day accumulations with the target values in the following table (Bessin 1992):

DD Target	Action taken when target reached
300 DD	Place black sticky tape to monitor crawlers.
380-400 DD	Crawler emergence should begin.
600-700 DD	Maximum crawler movement. Best time for insecticide spray



Figure 4. Heavy infestation of SJS on apple branch



Figure 5. Heavy infestation of SJS on apple foliage



Figure 6. Dark sticky tape, used for monitoring crawlers. Note crusty accumulation of scale.

**Dark sticky tape** – Movement of immature SJS, called crawlers, begins in mid May and can continue through June. Crawler activity is monitored with dark sticky tape, tightly wrapped around an infested branch (Figure 6). Remove debris with sandpaper before applying the tape. Monitor the tape frequently, watching for the minute, flattened yellowish insects. A 10x hand lens is useful in identifying the crawlers trapped on the tape. Replace tape as needed. SJS has 2-3 generations in Missouri, and growers with infested orchards should continue monitoring stick tape for crawler activity during the summer months.

### SJS control

Once an infestation of SJS is detected, it is unlikely to go away and will probably get worse. San Jose scale has many natural enemies, but experience in Missouri orchards suggests that natural enemies do not attack scale quickly enough to prevent permanent damage to trees.

The first step in SJS control is a dormant oil application in the spring, applied before budbreak on stone fruits and at green tip on apple. Complete coverage of the tree is essential for control; calibrate the sprayer, and plan to apply a dilute spray. For mature full size apples and pears, a dilute spray is 400 gallons per acre; for mature full size peaches, a dilute spray is 300 gallons per acre. Under heavy infestations an insect growth regulator such as Esteem or an insecticide such Lorsban, Supracide, or Diazinon can be mixed with the dormant oil; consult the Midwest Commercial Tree Fruit Spray Guide at <http://www.extension.iastate.edu/Publications/PM1282.pdf> for details.

The dormant oil spray should be followed by a foliar insecticide application that targets the crawlers. Time this spray by DD accumulation and monitoring of sticky tape for crawler activity. If crawlers are still emerging 10 days after the first foliar spray, a second spray may be needed. Continue monitoring sticky tape for crawler activity, and apply additional foliar insecticides as needed. At present, labeled insecticides include Diazinon, Esteem, Provado, Assail, and Centaur.

### References

- Bessin, R. 1992. San Jose Scale. University of Kentucky EntFacts 204.  
 Lewis, D.R. et al. 2006. Commercial Tree Fruit Spray Guide. University of Missouri MP651.  
 Welty, C. 2000. San Jose Scale on Fruit Trees. Ohio State University Extension Fact Sheet HYG-2039-92.

## Ripe for Wine?

*By Marilyn Odneal*  
*Horticulture Outreach Advisor*  
*Missouri State University*

If you are thinking about making wine for home use this year, now is the time to gear up. Missouri grape harvest begins in August and extends into October. There are over 50 wineries in our state, so you have a great opportunity to taste Missouri wines. Check out the Wonderful Wines of Missouri website at <http://www.missouriwine.org/> for winery locations.

You may also want to join the Missouri Winemaking Society for amateur winemakers at <http://www.mowinemakers.org>

And don't worry. Home winemaking is perfectly legal. The Tax and Trade Bureau (TTB) in Section 24.75 regulates wine made for personal or family use as follows:

- (a) General. Any adult may, without payment of tax, produce wine for personal or family use and not for sale.
- (b) Quantity. The aggregate amount of wine that may be produced exempt from tax with respect to any household may not exceed:
  - (1) 200 gallons per calendar year for a household in which two or more adults reside, or
  - (2) 100 gallons per calendar year if there is only one adult residing in the household.

Although many home winemakers use juice concentrate, fresh grapes are also an option. Missouri winegrape varieties offer the

home winemaker a wonderful spectrum of possibilities. They include red varieties such as Chambourcin, Concord, St. Vincent, Vincent and Norton/Cynthiana, pink varieties such as Catawba and Delaware, and white varieties such as Cayuga White, Seyval blanc, Vidal blanc, Traminette, Chardonel, and Vivant. If you decide on the fresh fruit option, you may be able to obtain grapes or juice from a commercial vineyard or you may even consider growing your own grapes. Keep in mind that, although some varieties like Norton/Cynthiana and Concord exhibit disease resistance, grapes generally require pesticide applications to manage fungal diseases. If you decide to plant grapes, note that a mature vine will yield from 10 to 15 pounds of grapes and you need about 15 pounds of grapes to yield 1 gallon of juice.



*Norton/Cynthiana is the state grape of Missouri.*

So how do you know whether or not a grape is ripe for wine? Ripeness depends on a combination of factors including the cultivar of grape you have, the end product you want, and the current growing season.

Cluster integrity is very important. It is great if you can wait until the grapes are at peak ripeness for the wine you wish to make, however, if the clusters are damaged (cracking from rain or damage from hail) and begin to rot, you have to harvest in order to salvage the crop. If you see bird depredation and you cannot net the crop to protect it from the birds, you may have to pick early before the birds harvest your



*Bird depredation on Norton/Cynthiana.*

crop for you. Birds like the small blue-black or red-pink berries best. Concord contains a natural bird repellent, methyl anthranilate, so birds are not usually a problem when growing Concord.

It is best to get a sugar level of 21 to 24 degrees Brix (percent) in the juice, but some varieties such as Concord, Catawba and Cayuga white, don't usually reach those levels, so additional sugar must be added to the juice before winemaking.



*The mighty Concord is an excellent, all purpose grape for Missouri home growers. Concord wine is best made in a sweeter style.*

The pH level of the juice is most important. It determines the microbial stability so the wine does not spoil. In general, for red wine grapes, the pH should be between 3.3 and 3.5 and for white wine grapes it should be between 3.2 and 3.4.

Acid level is another consideration for if the acid is too high, the wine will be too tart and if it is too low, the acid will not balance the sugars and the wine will taste flat. Acid levels should be in the 0.7 and 0.9 g/100ml for red juice and 0.6 and 0.9 g/100ml for white juice.

After veraison, the time when the berries begin to color (or become translucent if dealing with a white grapes), you may begin to take samples of the grapes in order to test for ripeness. Take a sample by collecting random berries from both sides of the trellis. 200 berries (100 from both sides of the trellis) is a good sample size, but if you have only a few vines, you can get by with less.

Information on processing the berry sample and testing the juice for sugar, pH and titratable acidity can be found in the "Making Wine for Home Use" bulletin available on the web at <http://mtngrv.missouristate.edu/publications/MWFHUpub.htm> Other publications related to grape growing include "Growing Fruit for Home Use" for home growers and "Growing Grapes in Missouri" and "Microvinification" for commercial producers. Both are available at <http://mtngrv.missouristate.edu/publications/> You may request our bulletins (variable costs applied) by contacting:

Pamela Mayer

[PMayer@missouristate.edu](mailto:PMayer@missouristate.edu) 417-547-7500  
9740 Red Spring Road

Mountain Grove, MO 65711-2999

Of course, you can grow grapes to eat and even make raisins in your food dehydrator from the seedless ones. Some grape varieties for table use are the seeded blue-black Concord, and Buffalo, the pink, seeded Delaware and Catawba, the seedless pink Reliance, Canadice and Vanessa, the seedless, blue-black Mars and the white, seedless Marquis. And you don't have to worry about testing the juice for table grapes. Just harvest them when they taste good!

## **Powdery Mildew Can Zap the Life Out of Pumpkins**

*By Gaylord Moore*

*Regional Horticulture Specialist  
University of Missouri*

Powdery mildew is possibly the most common summer disease that affects pumpkins in Missouri and the Midwest. We begin to experience the problem in July and August and the results can be quite drastic.

Symptoms of powdery mildew may show up on all the cucurbit crops including ornamental gourds, cucumbers, melon and squash. The disease may first appear as pale yellow spots on pumpkin leaves, stems and petioles. These spots become larger and covered with white spores that appear powdery. Infected leaves gradually turn yellow and then brown. As a result the size and overall quality of the fruit will be reduced. Due to the lack of leaf cover sunburn is an added problem.

According to Lewis Jett, State Vegetable Specialist with the University of Missouri Extension, two effective strategies for controlling powdery mildew are cultivar resistance/tolerance coupled with an effective spray program.

Based upon 2005 research and observation some of the top producers and powdery mildew resistant varieties were (Extra Large) Aladdin, (Large) Magic Lantern, (Medium) Magician, (Small) Mystic Plus and (Miniature) Touch of Autumn. However, all powdery mildew tolerant cultivars were sprayed every 14 days.

These varieties are not immune to mildew; they will get a fair amount of disease at the end of the season. However, the rate of mildew development appears to be much slower on resistant varieties. Resistant varieties tend to retain their leaves well into late August and September, whereas susceptible varieties tend to be defoliated by then.

Most effective control of powdery mildew is to implement a fungicide program in advance of



the disease. Starting a spray program in mid to late July and continuing every 14 days until the middle of September is the best plan to retain healthy leaves.

In Dr. Jett's study Quadris and Flint were the two fungicides of choice.

Be careful with your fungicide selections. Some labels require alternation between fungicides with different modes of action. Whether required by the label or not, it is a good idea to alternate between fungicides with different modes of action.

If you need help in making fungicide of choice decisions be sure and contact your horticulture specialist or Dr. Lewis Jett at the University of Missouri. Fungicides recommended for the control of powdery mildew are found in the 2006 Midwest Vegetable Production Guide to Commercial Growers available through your local University of Missouri Extension Centers.

## Power Foods

*By Marilyn Odneal*  
*Horticulture Outreach Advisor*  
*Missouri State University*

Swimsuit season is here and some of us are in the process of losing a few pounds (or at least trying to). Good news for fresh fruit and vegetable producers and consumers is the popular new Sonoma Diet formulated by Dr. Connie Guttersen, R. D., Ph.D. as a style of eating for weight loss and maintenance as well as good health.

This balanced "Mediterranean" diet promotes 10 "power foods" which include blueberries, strawberries, grapes (and wine), bell peppers, broccoli, spinach, tomatoes, almonds, whole grains and olive oil.

This diet promotes fresh produce, and suggests eating whole fruit rather than juice.

Although not a part of the initial 10-day "wave", fruits are an integral part of this eating style. Dr. Guttersen writes "If you have always thought of blueberries as a rare special treat, think of them now as a common special treat" and stresses their antioxidant properties. She hails grapes as "fruit of the gods" and strawberries as a "first rate power food that not only delivers the fiber, vitamin, and minerals you expect from a fruit but also a generous dose of especially beneficial phytochemicals."

Of course, the veggies hold their own and you can enjoy them right from the start in wave 1. Broccoli is promoted since it is not only rich in vitamin C and calcium, it also is high in a detoxifier called sulforaphane. Spinach is a low calorie source of iron, calcium and vitamin K. Green peppers are a tasty, low calorie nutritional powerhouse. Of course, Mediterranean cuisine, at least the southern Italian side, would not be complete without lycopene rich tomatoes. This eating plan is based on delicious combinations of balanced foods from all food groups, although fruits and veggies make up the majority of the stars.

So now you can let your customers know that mild mannered blueberries, strawberries, grapes, tomatoes, broccoli, green peppers and spinach are the superheroes on the list of Sonoma Diet Power Foods!

### Reference

The Sonoma Diet: Trimmer Waist, Better Health in Just 10 Days! [Connie Guttersen](#), [Stephanie Karpinske](#) (editor). 2005. Meredith Books. 320 pages.

## Shade Tree Decline

*By Jennifer Schutter*

*Regional Horticulture Specialist  
University of Missouri*

A tree that just doesn't look quite as healthy as usual, but does not have any specific disease or insect problem may be suffering from shade tree decline. Decline is a general term describing dieback of the branches in the crown, associated with a general reduction of tree vitality.

The symptoms usually develop slowly, and may not be noticed immediately. The leaves may become smaller and fewer in number. The crown of the tree often thins out. New terminal growth may be limited, and branches may die. Abnormally large seed crops are sometimes associated with decline, as is early fall color and leaf drop. Trees affected by decline may survive for many years, or may die within a few years. Some trees I often see suffering from decline include Sugar and Silver Maples and Ash trees. Dead branches in the upper canopy are characteristic of decline in these trees.

Trees may decline for many reasons, often a combination of factors may be involved. Following is a list of factors that may contribute to tree decline:

- Long term leaf loss.
- Repeated leaf loss, from insects or diseases.
- Adverse weather conditions, such as rapid changes in winter temperatures, late spring and early fall frosts, and drought.
- Flooding, or changes in the water table.
- Bark damage from lawn mower injury, weed eaters, frost cracks, or animal feeding.
- Soil pH problems - usually when the soil is too alkaline.
- Injury from lawn weed killers or other chemicals.
- Damage from construction around the tree, such as soil fill, severe root loss, or soil compaction from heavy equipment.
- Accumulated salt injury from road salt.

- Restricted root development.
- Stem Girdling Roots
- Graft union failure.
- Root and trunk rot, as evidenced by mushrooms or other fungal structures.

Diagnosing shade tree decline is difficult and it is often impossible to confirm an exact cause. When diagnosing shade tree decline, remember that symptoms don't always occur immediately following the initial injury. Evaluate possible causes of plant stress over the past 5 years.

The best way to control tree decline, is to take preventative measures, and whenever possible, to avoid stress factors that contribute to the problem. If decline symptoms appear that can't be traced to a specific insect or disease, try to increase the health of the tree by mulching and providing additional water during dry periods. Prune out any dead wood or branches.

## Coming Events

**Alternative Fruit Crops Field Day**  
**Thursday, August 3, 8:30am to 3:00pm**  
**Faurot Hall 102**  
**Fruit Experiment Station**  
**Missouri State - Mountain Grove**

The public is invited to the **Alternative Fruit Crops Field Day** scheduled for Thursday, August 3, at the Missouri State University State Fruit Experiment Station in Mountain Grove. The event commences at 8:30am and will conclude at 3:00 in the afternoon. For many years the staff of the State Fruit Experiment Station has investigated alternative fruits, and the program for this field day will focus on several of the more promising crops. The event will begin with presentations on elderberry, pawpaw, persimmon, sand plum, and minor fruits. Presenters from Missouri State will include Patrick Byers and John Avery.

Several invited guest speakers will also share their experiences with alternative fruits, including Andrew Thomas of the University

of Missouri and Bill Reid of Kansas State University. A tour of the alternative fruit crops research plantings and the horticulture garden will take place in the afternoon. There is no charge to attend the Alternative Fruit Crops Field Day. For more details, visit <http://mtngrv.missouristate.edu/> and see the list of upcoming events. For additional information or to register for the events, contact the Missouri State Fruit Experiment Station at 417-547-7500.

**Bulb Forcing Workshop**  
**Monday, September 11, 6 - 7pm**  
**Faurot Hall 102**  
**Fruit Experiment Station**  
**Missouri State - Mountain Grove**

**Bill Eskes** of Hummert International will be featured in a workshop on how to plant a layered bulb bowl to brighten up your winter season. His technique of planting different types of bulbs (grape hyacinth, mixed crocus, narcissus, tulips, and mini irises) in layers results in a changing kaliedoscope of indoor color as each type of bulb grows and blooms. Bill has extensive experience in growing cut flowers, roses and of course, bulbs.

The workshop is presented by the Tri-County Master Gardeners and the Missouri State Fruit Experiment Station.

Each attendee will receive materials and hands-on instruction to assemble a bulb bowl to condition and grow at home. The cost for the Bill's hand selected bulbs, bulb bowl, planting media and bone meal starter is \$20.00 per person.

Please register by September 1, 2006. Request additional information from or send payment to:

Pamela Mayer  
Missouri State Fruit Experiment Station  
9740 Red Spring Road  
Mountain Grove, Missouri 65711  
Phone: 417-547-7500  
[PMayer@missouristate.edu](mailto:PMayer@missouristate.edu)

(checks payable to Missouri State Fruit Experiment Station)



*A simple pot of tulips is ready to grow when the roots are seen at the bottom of the pot. Just place in a warm, sunny window to grow and brighten up the dormant season.*

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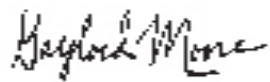
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